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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,484	10/23/2003	Mac Stevens	P156C1-US	2568
50905 7590 06/19/2007 N. KENNETH BURRASTON KIRTON & MCCONKIE P.O. BOX 45120 SALT LAKE CITY, UT 84145-0120			EXAMINER GEBRESILASSIE, KIBROM K	
			ART UNIT 2128	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/693,484

Applicant(s)

STEVENS ET AL.

Examiner

Kibrom K. Gebresilassie

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to amended application filed on April 02, 2007.
2. Claims 2-54 are pending.
3. Claims 43-54 are new.

Response to 101 rejection:

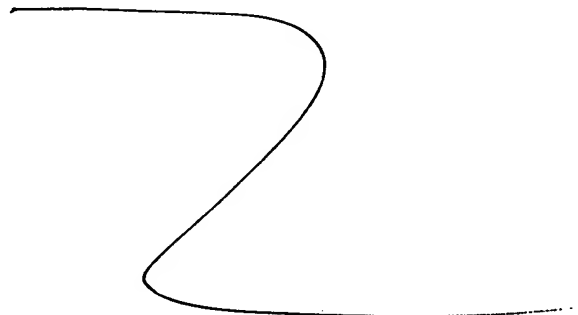
4. Applicant's arguments, see Remarks page 11, filed April 02, 2007, with respect to claims have been fully considered but they are not persuasive. [See: **Claim Rejections - 35 USC § 101 below**].

Response to Double Patenting Rejection

5. In response of double patenting rejection, applicants promised to file a terminal disclaimer but would prefer to do so after other issues regarding patentability have been resolved and therefore the rejection is maintained until applicants provide a Terminal Disclaimer (See: **Double Patenting Rejection** below).

Response to 102 rejection

6. Applicant's arguments filed April 02, 2007 have been fully considered but they are not persuasive.



a. Applicant's argued:

In contrast, as acknowledged in the Office Action, the only thing Vaughn adjusts are already created paths (i.e., "segments"). A segment is not a node but is a portion of a path, often consisting of connected nodes. Vaughn therefore does not adjust nodes but adjusts portions of the path as the path is being routed. Vaughn is therefore unlikely to function as efficiently as the computer of claim 2 because Vaughn first creates the paths, or at least portions of the paths (i.e., segments), and thereafter adjusts the already created segments around obstacles.

In response, the prior art of reference focused on making inflexible nodes to be flexible in the routing process.

The prior art of reference recites as follows:

planar surface. Other limitations of prior art routing schemes include non-uniform routing surface areas and inflexible node locations which generally remain fixed throughout the routing process. These limitations do not readily lend themselves to systematic analysis and thus impede the routing process. What is needed is a system and a method for routing the circuit paths that is not subject to such limitations.

Further, the prior art of reference discloses:

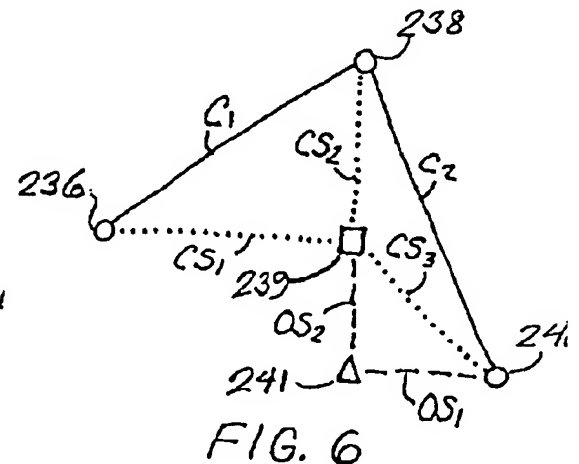
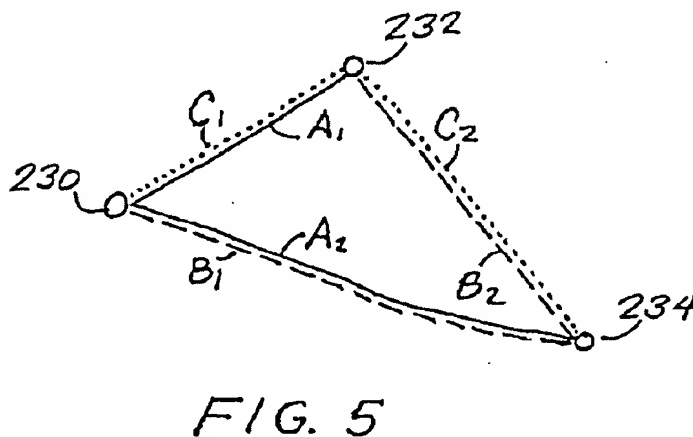
between the orthogonal components of the direct paths. For example, such a virtual node or target could be used to specify the junction of orthogonal paths which meet at a right angle. A virtual node or target may be temporary and it may be movable during routing analysis; other virtual

Therefore, the prior art of reference clearly adjusts the nodes at the time of routing process.

b. Applicant's argued:

For example, because there are only three connection points 230, 232, 234, there are simply not enough connection points for there to be a source node, a destination node, and a plurality of intermediate nodes, as recited in claim 12.

In response, the prior art of reference discloses a source node, a destination node and a plurality of intermediate nodes. For example, see figures 5 and 6 as shown below:



c. Applicant's argued:

As another example, connection points 230, 232, 234 are not linked and thus cannot be "linked nodes" as recited in claim 12. Applicants note that, if the PTO deems path segments A1, A2, B1, B2, C1, and C2 links, then there is nothing in the minimum spanning analysis shown in Figure 5 the PTO could equate with the partial paths recited in claim 12.

Applicant's specification recites as follows:

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44 of Figure 4). It is then time to link the nodes of the graph (step 46 of Figure 4). This entails creating links (which can be visualized as line segments) linking one node with another. As will be seen, each link represents a possible portion of a route for a trace.

In light of applicant's specification, "linked nodes" are just two nodes, which are connected by a segment, which is clearly disclosed in the prior art of reference.

For example, see Figure 7A below:

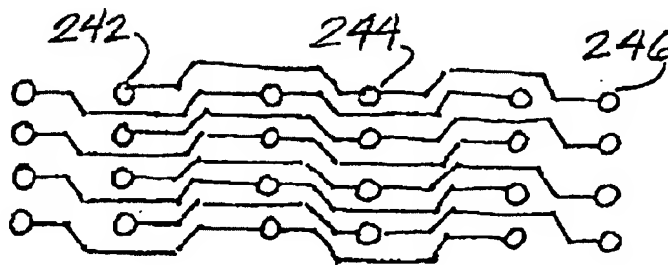


FIG. 7A

d. Applicant's argued:

As still another example, the paths that connect the three connection points 230, 232, 234 can end on or pass through any of the connection points, and therefore none of the connection points 23, 232, 234 is a source, destination, or intermediate node. This is because Vaughn's minimum spanning tree analysis does not care where the selected connection paths starts or ends.

In response, the prior art of reference cares where the selected connection path starts or ends. Without having a starting point and ending point, it is impossible to have a routing process.

The prior art of reference recites as follows:

routing zone controller 114. Every path to be routed on the circuit board is defined in terms of a segment which is an ordered pair of nodes; that is, the segment is defined in terms of two nodes, for example, a start node and a destination node. It is also possible that each of the two nodes could be a target or a terminal. Each node is defined as a point on the

e. Applicant's argued:

Vaughn's minimum spanning tree analysis illustrated in Figure 5 thus does not "[discard] all of said partial paths that extend to one intermediate node" except for one path.

In response, the main focus of the claimed invention of the prior art of reference is to select the shortest most direct path connections made between the nodes. Therefore, the minimum spanning tree analysis calculates the length of each path and evaluates which of the paths has the shortest overall length. After selecting the shortest path, it is obvious to discard the rest.

7. Examiner finds applicant's argument unpersuasive and the rejection is maintained.

Priority

8. The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 09/938, 789, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. For example, the claimed invention recites a "computer-readable media". There is no any support in the prior application and therefore no priority is granted for the later-filed application for this matter.

Specification

9. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed invention recites a "computer-readable media" and the specification does not provide proper antecedent basis for the claimed subject matter.

Claim Objections

10. Claims 49-54 are objected to because of the following informalities: The "computer" should be replaced with the "media". Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 2, 12, 18, 22, 32, and 39 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2, 12, and 16 of U.S. Patent No. 6,678,876.

Although the conflicting claims are not identical, they are not patentably distinct from each other because all claims are directed to creating an initial array of nodes within a routing space, adjusting initial array of nodes, and selecting a path through adjusted array of nodes.

Claims 2, 12, and 16 of Patent No. 6,678,876 contain every element of claims 2, 12, and 18 of the instant application and anticipate the claims of the instant application. Claims of the instant application are not patentably distinct from the earlier patent claims

and as such are unpatentable over obvious-type double patenting. A later application claim is not patentably distinct from an earlier claim if the later claim is anticipated by the earlier claim.

Claims 22, 32, and 39 of the instant application are software version of Claims 2, 12, and 18. Therefore, the same rejection is applied as Claim 2, 12, and 18 of the instant application.

Claim Rejections - 35 USC § 101

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13. Claims 2-54 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed invention would impermissibly cover every substantial practical application of, and thereby preempt all use of the equation of the routing algorithm (**See: for example claim 2**) and therefore the claimed invention is non-statutory.

Claim Interpretations

14. In the interest of compact prosecution, the Examiner makes the following claim interpretations in order to apply prior art to the claims. See *Ex parte Ionescu*, 222 USPQ 537 (Bd. Pat. App. & Inter. 1984).

15. A "computer-readable media" is interpreted as a physical hardware media.

In general, for the reasons provided earlier, the state of the claims in the instant application precludes a limitation-by-limitation assessment of the claimed invention compared to the prior art. The Examiner cannot interpret the meanings of the claims without relying on speculation. See *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962). However, in the interests of compact prosecution, a prior art rejection is applied nevertheless.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. Claims 2-54 are rejected under 35 U.S.C. 102(e) as being anticipated by US Publication No. US 2001/0038612 A1 issued to Vaughn et al.

Claim 2 (Previously presented):

Vaughn discloses a computer comprising:

means for creating an initial array of nodes within a routing space (See: [0009]; [0067]);

adjusting means for adjusting said initial array of nodes, including adjusting node between at least a pair of obstacles in said routing space (**See: [0068] lines 15-18**); and

means for selecting a path through said adjusted array of nodes (**See: [0068] lines 18-21; [00112]**).

Claim 3 (Previously presented):

Vaughn discloses the computer of claim 2, wherein said adjusting means comprises:

determining means for determining a number of paths that may pass between said pair of obstacles and means for adjusting a number of nodes between said pair of obstacles to be equal to said number of paths (**See:[0157] lines 8-13**).

Claim 4 (Previously presented):

Vaughn discloses the computer of claim 3, wherein said determining means determines a number of paths that may cross a line segment between said pair of obstacles (such as ...*calculate density tiles*; **See: [0108] lines 1-8**).

Claim 5 (Previously presented):

Vaughn discloses the computer of claim 2, wherein said adjusting means adjusts a number of nodes along a line segment between said pair of obstacles to be equal to a number of permissible paths between said pair of obstacles (**See: [0109]**).

Claim 6 (Previously presented):

Vaughn discloses the computer of claim 2, wherein said adjusting means adjusts locations of said nodes located between said pair of obstacles (**See: [0182] lines 7-10**).

Claim 7 (Previously presented):

Vaughn discloses the computer of claim 6, wherein said adjusting means further positions said nodes located between said pair of obstacles to correspond to permissible locations of paths between said obstacles (**See: [0182] lines 4-10**).

Claim 8 (Previously presented):

Vaughn discloses the computer of claim 2, wherein said adjusting means adjusts a location of each of at least one of said nodes in accordance with a proximity of said node to an object in said routing space (**See: [0067] lines 9-13**).

Claim 9 (Previously presented):

Vaughn discloses the computer of claim 2 further comprising linking means for linking said adjusted initial array of nodes (**See: [0162] lines 1-6**).

Claim 10 (Previously presented):

Vaughn discloses the computer of claim 9, wherein said linking means creates a link between each node in said array and nodes within a predetermined proximity of said each node without crossing any of said links (**See: [0104] lines 5-6**).

Claim 11 (Previously presented):

Vaughn discloses the computer of claim 10, wherein said path traverses ones of said links (**See: [0163] lines 10-15**).

Claim 12 (Previously presented):

Vaughn discloses a computer comprising:

providing means for providing an array of linked nodes within said routing space, said array including a source node, a destination node, and a plurality of

intermediate nodes (such as...***start node, interim node and target node....***;See; [0184]); and

determining means for determining a path from said source node to said destination node through said linked nodes (**See: Fig. 14G**), wherein said determining means comprises:

creating means for iteratively creating a plurality of partial path, each said partial path extending to an intermediate node in said array (**See: [0180]; Fig. 6**);

means for determining a routing cost of each said partial path (such as ...***selects the shortest path....***;See: [0104]); and

means for discarding all of said partial paths that extend to one intermediate node except the partial path with the lowest routing cost if more than one partial path extends to said one intermediate node (such as ...***the minimum spanning tree analysis....***; See: [0113], [0114], Fig. 5 and Fig. 6).

Claim 13 (Previously presented):

Vaughn discloses the computer of claim 12, wherein said creating means creates a plurality of partial paths by creating initial paths from said source node to first nodes linked to said source node (**See: Fig. 14G**).

Claim 14 (Previously presented):

Vaughn discloses the computer of claim 13, wherein said creating means creates a plurality of partial paths (such as ***interim nodes***; **Fig. 14F and 14G**) further by extending said initial paths from said first nodes to nodes linked to said first nodes (**See: Fig. 15A**).

Claim 15 (Previously presented):

Vaughn discloses the computer of claim 12, wherein said providing means further, for each node in said array, creates a link between said each node and nodes within a predetermined proximity of said each node without crossing any of said links (See: [0104] lines 5-6).

Claim 16 (Previously presented):

Vaughn discloses the computer of claim 12, wherein said providing means further, for each node in said array, creates shortest links between said each node and nodes within a predetermined proximity of said each node without crossing any of said links (See: [0104] lines 1-9).

Claim 17 (Previously presented):

Vaughn discloses the computer of claim 12, wherein said providing means further:

selects one of said nodes of said array; creates a link to another node of said array that is within a predetermined distance of said selected node; and if said created link crosses another link, deletes a longest of said crossed links (See: [0113]).

Claim 18 (Previously presented):

Vaughn discloses a computer comprising:
creating means for creating an initial array of nodes within a routing space ([0009] lines 6-9);

adjusting means for adjusting said initial array of nodes, including adjusting a location of each of at least one of said nodes in accordance with a proximity of said node to an object in said routing space (such as ...***routing the segments around obstacles...***;See: [0068] lines 15-18); and

selecting means for selecting a path through said adjusted array of nodes (such as ...***storing the path routing...*** See: [0068] lines 18-21).

Claim 19 (Previously presented):

Vaughn discloses the computer of claim 18, wherein said adjusting means:

applies a force to said node, wherein a magnitude of said force corresponds to said proximity of said node to an obstacle, and moves said node in accordance with said force (such as ...***bypass obstacles...***See: [0170] and Fig. 13 C).

Claim 20 (Previously presented):

Vaughn discloses the computer of claim 18, wherein said adjusting means adjusts a location of each of at least one of said nodes in accordance with a proximity of said node to a plurality of said objects in said routing space (such as ...***routing the segments around obstacles...***;See: [0068] lines 15-18).

Claim 21 (Previously presented):

Vaughn discloses the computer of claim 20, wherein said adjusting means:

applies a plurality of forces to said node, wherein a magnitude of each of said plurality of corresponds to said proximity of said node to one of said plurality of obstacles; and moves said node in accordance with a sum of said plurality of forces (such as ...***bypass obstacles...***See: [0170] and Fig. 13 C).

Claim 38 (Previously presented):

Vaughn discloses the media of claim 32, wherein said step of determining a routing cost of each said partial path comprises estimating a length of a path from said source node to said destination node through the intermediate node to which said partial path extends (such as ...*minimum length path*...; **See: [0104] lines 12-17**).

As per Claim 43:

Vaughn disclose the computer claim 2, wherein said path corresponds to a path for a trace or wiring in an electronic system (**See: Title**).

As per Claim 44:

Vaughn discloses the computer of claim 2, wherein said path is stored within said computer (**See: [0064]**).

As per claims 22-37, 39-42, and 45-54:

The limitations of claims 22-37, and 39-42 have already been discussed in the rejection of claims 2-21 and 43-44. The instant claims is/are functionally equivalent to the above rejected claims and is/are therefore rejected under the same rationale.

Conclusion

18. Claims 2-54 are rejected.

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communications

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is 571-272-8571. The examiner can normally be reached on 8:00 am - 4:30 pm Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HUGH JONES Ph.D.
PRIMARY PATENT EXAMINER
TECHNOLOGY CENTER 2128